BOTANY OF THE DARLING, NEW SOUTH WALES.

BY FRED. TURNER, F.L.S., F.R.H.S., ETC.

INTRODUCTION.

The Darling River and its tributaries drain an immense area in New South Wales, and although I have botanised over a great portion of it, this paper only refers to the vegetation found between the parallels 29° to 33° South and the meridians 141° (the boundary of this State and South Australia) and 147° East. The configuration of this region consists for the most part of nearly level country with isolated hills and a few mountain ranges, none of which, however, attain great altitude. This section of the country may be described as consisting of immense, treeless plains separated here and there by large belts of timber, and considerable areas of open forest, mallee, and scrub country. Some of the plains are composed of black soil, others of red loam, and certain are of a sandy nature. These are the principal soils of the Darling country, but there are many of an intermediate character. Some of the hills and ranges are very stony and difficult to ascend.

CLIMATE.

Temperature at Bourke.

Mean temperature		69.7°
Mean summer temperature	•••	83.6°
Mean winter temperature		54.7°
Highest temperature (shade)		127.0°
Lowest temperature (shade)		28.0°

In the extreme north-west, at Milparinka for instance, the temperature will range a few degrees higher, but those referred to will give a good idea of the climate of the Darling country.

RAINFALL.

The mean annual rainfall at Wilcannia is $11\frac{1}{2}$ inches, but it ranges from $9\frac{3}{4}$ inches in the extreme west to $19\frac{1}{2}$ inches in the extreme east.

WATER.

The principal natural water of this region is the Darling River (the "Calla-watta" of the aborigines), its tributaries, and several lakes. In propitious seasons the billabongs and deep depressions generally contain large quantities of water. Artificial supplies of water are obtained from a number of Government and private artesian wells. In this direction much enterprise has been shown, and many wells have been sunk into the cretaceous beds and abundant supplies of water obtained.

THE FLORA.

The first time that I had the privilege of examining plants collected in the Darling country was in April, 1880, but a few years previously I had seen similar flora from the south-western portion of Queensland. Amongst a number of collections of western plants that have since passed through my hands, the following might be referred to :- In 1885, at the request of Dr. E. P. Ramsay, F.R.S.E., then Curator of the Australian Museum. I named that very fine collection of graminaceous plants made by the late Mr. K. H. Bennett in the neighbourhood of Ivanhoe and Mossgiel. That collection was forwarded to the Indian and Colonial Exposition in London. Some time after this I named, by request, a large collection of plants from the Wilcannia district for Mr. J. H. Maiden, F.L.S, then of the Technological Museum, now Government Botanist. At the request of Mr. H. C. L. Anderson, M.A., Principal Librarian, Public Library, Sydney, I named those beautiful paintings, executed by Mrs. Harriet Forde whilst on the Darling in 1865-6, of some of the notable plants of the interior. Those paintings are now in the Public Library. In 1888 I figured and described some of the economic plants of the Darling; and all the principal trees, shrubs, saltbushes and herbs of that region which produce edible

foliage for stock are figured and described in my book on the indigenous "Forage Plants of Australia" (non grasses) published in 1891. The most valuable graminaceous plants of that part of the State are figured and described in my work on the "Grasses of New South Wales," 1890, and "Australian Grasses," 1895. In 1900, at the request of the President of the Royal Commission on Western Lands, I wrote a voluminous report on the economic value of the flora of the Darling and the best means of conserving This is embodied in the Commissioners' Report to the Parliait. ment of New South Wales. Since I first examined plants collected in the Darling country I have made many botanical excursions thither, both in good and bad seasons, and almost every time have seen some plants in bloom that I had not previously observed in that condition. The vegetation is so dissimilar from that growing on the eastern side of the Dividing Range that it has always had a peculiar interest for me. Some writers have described the western flora as sombre-looking and monotonous; this observation to a certain extent is true, especially when the pine forests, mallee, and scrub country are viewed from the hills or mountain ranges; nevertheless it is on the whole most interesting to the botanist, and much of it of great economic value to the pastoralist. One of the most charming arboreal floral displays I ever saw in the interior of this country was west of the Darling River where an open forest of Coolibar trees (Eucalyptus microtheca, F.v.M.) was in full bloom. The somewhat pendulous smaller branches of these trees were so densely covered with flowers that with the slightest breeze some of the lower ones swept the ground. To obtain a good knowledge of the flora of this region it is necessary to see and examine it at all times of the year, and in favourable and unfavourable seasons. This T have done, and by way of illustration may mention the fact that on a comparatively small area between the Darling River and Wanaaring one morning in a good season I collected more than ninety distinct species of plants, and about eighteen months afterwards the same ground was almost destitute of herbage, although several trees and shrubs were blooming profusely.

Towards the end of the comparatively mild winters experienced in the far west the bright flowers of many Cruciferous plants are a conspicuous feature on many of the plains. Several species, such as Cardamine tenuifolia, Hook., Blennodia cardaminoides, F.v. M., Thlaspi cochlearinum, F.v. M., and T. ochranthum, F.v. M., have comparatively large flowers and are certainly worth garden culture. One of the most beautiful evergreen trees is the so-called "native orange," Capparis mitchelli, Lindl. I have seen this tree producing its curious showy flowers in the driest seasons, and then it never fails to attract the attention of the most unobservant person. This species and one of the dwarfer-growing capers, Capparis lasiantha, R.Br., produce edible fruits of pleasant taste and much appreciated by the blacks. Pittosporum phillyræoides, DC., is a very graceful tree with pendulous branches, narrow, evergreen, long leaves and small, bell-shaped flowers which are usually produced in great profusion. I have grown and flowered it to perfection in the neighbourhood of Sydney. In dry situations in the coastal districts it succeeds admirably and is well worth planting in mixed shrubberies. Malvaceous plants are fairly well distributed, some species producing showy flowers of various colours. One of the most beautiful flowering plants of this family is the "native cotton," Gossypium sturtii, F.v.M., which I have seen successfully cultivated in a garden at Bourke. Amongst the ornamental, and from a pastoralist's point of view the most valuable, trees in the interior is Sterculia diversifolia, G. Don. Its leaves are readily eaten by stock, which thrive on them. The seeds, usually produced in great abundance, contain 1.8 per cent. of caffeine, and I have made a capital beverage after roasting, grinding and macerating the grounds in a similar way to coffee. Nitraria schoberi, Linn., of the "bean caper" family, is a most interesting shrub with rigid branches, succulent leaves, and somewhat oval-shaped fruits which are edible but have a peculiar flavour to those not accustomed to eat them. They are, however, esteemed by the aborigines. Included under Rutaceae is the interesting flowering shrub Eriostemon difformis, A. Cunn.,

the "wilga" (Geijera parvi/lora, Lindl.) which is often, and I think rightly, described as the most graceful tree of the interior, and the "native cumquat," Atalantia glauca, Hook. Of Owenia acidula, F.v.M., the "Colane," there is a pretty legend told by the aborigines of the Bogan. On some of my travels I have frequently remarked how very rarely a young "Colane" was to be seen, notwithstanding the fact that the old trees produce quantities of fruit which when ripe fall off and sometimes lie thick upon the ground under the branches. The blacks say that "little fellow moth comes out of fruit, flies along the plain, lays egg in the ground, and up comes 'Colane.'" The fruit is certainly attacked by some insect and the germ probably destroyed in a number, for small, circular holes may be seen in the hard putamen of many of those that have lain on the ground for some time. The reason, however, that so few young trees are seen is probably because stock eat them before they have a chance to grow to any height. An allied tree, Flindersia maculosa, F.v.M., has a remarkably spotted trunk, hence its popular name "Leopard tree." Its leaves make good feed for stock, and from its trunk and larger branches exude quantities of an ambercoloured gum of a pleasant taste, but it is not collected as a commercial product. The Leguminous plants of this region are both numerous and interesting, and when in bloom show to great advantage. Amongst the plants producing the showiest flowers are "Sturt's desert pea" (Clianthus dampieri, A. Cunn.), and those known locally as "Darling pea" (Swainsona spp.). These beautiful flowering plants have long since attracted the attention of horticulturists, and may now be seen growing in many Australian gardens on the eastern side of the Dividing Range as well as in the plant houses of Europe and America. Two species of Swainsona, S. greyana, Lindl., and S. galegifolia, R.Br., are suspected poison plants, the latter species having a bad reputation amongst stockowners.*

^{*} See Fred. Turner's and F. B. Guthrie's description and analysis of this plant, Agri. Gaz. of N.S.W., Vol. iv., p. 84.

One of the most interesting and at the same time most useful fodder plants is the "Darling clover," *Trigonella suarissima*, Lindl. Sir Thomas Mitchell was the first to find this plant on the Darling and to recommend it for its agreeable perfume and its delicious flavour as a vegetable. Amongst the shrubby *Leguminosæ* the various species of *Cassia* bloom profusely at certain seasons of the year, and the same may be said of some of the dwarfer-growing kinds of *Acacia*. Many species of the latter genus grow into fine trees, and certain of them produce timber useful for industrial purposes, whilst the leaves of some furnish feed for stock during dry periods.

Over a great portion of this region the genus Eucalyptus, either in an arboreal or shrubby state, occurs in greater or less profusion. Some of the species yield valuable timber which is used for a variety of purposes where strength and durability are required. The "River" or "Red Gum," Eucalyptus rostrata, Sch., grows fairly plentifully on the margins of the watercourses and on land subjected to periodical inundation, where it frequently attains large dimensions. The courses of the Darling River and its tributaries can be defined miles away by this tree, which is always a very distinctive feature in the landscape. Under Cucurbitaceae there is one indigenous species, Cucumis trigonus, Roxb., which is found in various districts, and an allied African plant, Cucumis myriocarpus, Naud., has become acclimatised and has spread very much during recent years, especially on the lighter soils. The Australian mistletoe is growing on many trees and shrubs; one of the most common species being Loranthus pendulus, Sieb., though four other kinds are to be seen growing in varying proportions. Composita are well represented, especially on the plains, where usually during the early summer months and often in the autumn after rainfall the country looks like one immense flower garden. The blooms include many shades of colour, from white and yellow to bronze or red; the first-named colours predominating. Their habit, too, is most variable; certain are amongst the most diminutive plants in the interior of Australia, whilst others assume a shrubby habit.

The greater number, however, are dwarf-growing plants. Such genera as Helichrysum, Helipterum, &c., which produce what are known as everlasting flowers, are very showy and in ordinary seasons grow to perfection. The flowers are much esteemed by settlers in the interior, who use them for house decoration. Several species of the genus *Calotis* are disliked by the sheepowner on account of the "burr"-like fruiting heads which they produce. The pappus surmounting each achene is composed of barbed bristles or sharp spines which get matted in the fleece, and being most difficult to get out, to a certain extent cause a depreciation in the value of the wool from a commercial point of view. The introduced South American plant called "Bathurst burr" (Xanthium spinosum, Linn.) is another very troublesome weed to the sheep owner. It has not spread as much, however, as I thought it would a few years ago; still it is fairly abundant in many places. The snuff plants, Myriogyne minuta, Less., and M racemosa, Hook., are common in certain seasons, and usually grow on land liable to periodical inundation. The late Rev. Dr. W. Woolls, F.L.S., published some interesting particulars about these plants a few years ago. Goodenoviece are more largely represented in the western flora than one would expect. Several species of Goodenia and allied genera are an interesting sight when in bloom. Under Campanulaceae there are only three genera, but two pretty flowering species of Isotoma and the Australian "blue bell," Wahlenbergia gracilis, DC., when in flower arrest attention. Pratia erecta, Gaud., of this family is a suspected poison plant. The climbing plants are not very numerous as regards species, but frequently one meets with a single representative of the following genera: Clematis, Jasminum, Parsonsia, Lyonsia, Pentratropis, Marsdenia, and Tecoma. The first and last named of these produce the showiest flowers. A curious plant is Sarcostemma australe, R.Br. In Queensland it is said to be very poisonous to stock, and in West Australia it has the reputation of being a good forage plant. My description of it has been published by the Government of West Australia for the information of land owners of the western State. Quite a number

of interesting Borageworts are found both on the high and low land. Amongst the species of Solanum recorded in the following pages several are suspected by pastoralists of poisoning or causing injury to stock. The native tobacco, Nicotiana suaveolens, Lehm., and the South American one, Nicotiana glauca, Grah., are suspected stock-poisoners. The latter has spread very much on the rich alluvial banks of rivers, billabongs and creeks during the last few years. The renowned Pituri, Duboisia hopwoodii, F.v.M., occurs sparingly here and there. I had the privilege of witnessing some very important experiments carried out by the late Dr. Joseph Bancroft, of Brisbane, with an extract made from the leaves and smaller branches of this shrub. For further particulars see Dr. Bancroft's pamphlet on Pituri. Mimulus prostratus. Benth., of this family often covers the ground near lagoons with its charming blue flowers and when seen from a distance has the appearance of water. Under Myoporinea is included the genus Eremophila, the species of which are amongst the most interesting in the interior. Most of them are of shrubby habit. but a few attain the dimensions of small trees. Eremophila mitchelli, Benth., is frequently called sandalwood on account of its fragrant timber. Many of these species are worth the attention of horticulturists not only for their ornamental appearance but for their charming flowers, which are usually produced in great profusion. A few interesting Labiates are found in different places, and one of the sweet-smelling native mints, Mentha australis, R.Br., is common on land that is liable to periodical inundation.

The order *Chenopodiaceæ* includes all those plants popularly known as "saltbush," which are amongst the most valuable in Australia for feeding stock. From various causes these plants are gradually disappearing from the interior, much to the regret of pastoralists. There are eleven genera and fifty-eight species found in varying proportions over this region. Of these I have figured and described, as to their economic value, thirty-four, under the authority of the Government of New South Wales. Amongst the *Amarantaceæ* are several species of *Trichinium*

which are worth garden culture, as the flowers of these plants are most interesting and they are easily grown. The segments of the perianth are densely hairy and the colours range from greenish-vellow to bright purple. Under Polygonaceæ there are only three genera in the interior, but one of the species, Muhlenbeckia cunninghami, F.v.M., commonly known as "Lignum scrub" or "Sturt's leafless bramble." is of interest owing to the fact that during recent adverse seasons stock have taken to eating its usually succulent branchlets. Similar remarks as regards representation apply to *Protaceæ*, and there is one species of Grevillea (G. striata, R.Br.) worthy of notice. This tree is popularly known as "beefwood," and its timber is of some economic value, while its long, narrow leaves furnish food for stock when pasture herbage is scarce. Of the six species of Pimelea recorded in this paper some are regarded with suspicion by stock owners. Euphorbiacea are fairly abundant in many parts of the far west, and several species are suspected poison plants. Amongst these is Euphorbia drummondii, Boiss., which has the reputation of poisoning more sheep than any other Australian plant. From numerous enquiries and from observation extending over a very long period it appears that when the plant is in fruit and wet with dew or rain and is eaten by sheep it causes most injury to the animals. Four species of Casuarina are found dotted here and there over this area. The timber they yield is of some commercial value, and the branchlets are largely fed to stock in adverse seasons. The "Quandong" or "native peach." Fusanus acuminatus, R.Br., of the Santalaceae, is fairly abundant. In ordinary seasons this tree produces quantities of fruit, the succulent epicarp of which is often employed for preserves and the pitted endocarp for beads which are made into necklaces, whilst the kernel, which is edible and of a pleasant flavour, is of an oily nature and may prove of some economic value eventually. Although there are only two species of the Conifer family found in the interior, they occupy immense areas of both inferior and good country and have been gradually increasing during the last two decades. Where these trees are

established on inferior country it certainly would be wise to judiciously thin them out, then those that are left would prove of considerable commercial value and in the near future might be classed as a valuable State asset.

Amongst the Monocotyledonece I have found only one orchid (Cymbidium canaliculatum, R.Br.) and that is an epiphytal species. It was of some slight food value to the aborigines who used to eat its pseudobulbs which contain a small amount of starch. The Amaryllideæ consist of one species of Crinum and two of Calostemma, which grow over fairly large areas usually of a sandy nature in different parts of the far west. When in bloom these plants make a magnificent display, which would quite astonish any botanist or horticulturist seeing it for the first time. I have successfully grown these plants in the neighbourhood of Sydney, and I can highly recommend them for more extensive cultivation. A few species of the lily family are found almost all over this area. Two of them, Bulbine bulbosa, Haw., and B. semibarbata, Haw., are suspected poison plants. Juncus communis, E. Mey., is spreading, particularly on the margins of the streams flowing from some of the artesian wells. The dissemination of this plant is probably due to water fowl unconsciously carrying the ripe seeds on their legs or webbed feet and depositing them far from the plants on which they were matured. Cyperaceæ are numerous in many parts, but Gramineæ are abundant, as there are thirty-nine genera and ninety-nine species besides varieties, as well as several introduced ones. Of the number indigenous to this region I have figured and described (as to their economic value) fifty-one, under the authority of the Government of New South Wales.

Acotyledonece, as far as vascular Cryptogams are concerned, and this Census does not take into account cellular Cryptogams, are poorly represented. I have only observed five species arranged under three natural orders. One of the most interesting of these plants is the "Nardoo," Marsilea drummondii, A.Br. A figure and full description of this plant appears in my book on the indigenous "Forage Plants of Australia" (non grasses). This is the first Census of the *Phanerogamia* and vascular *Cryptogamia* of the Darling country, and I hope it will be found useful to those who desire to study the flora of that portion of New South Wales. Many plants not hitherto recorded from that region will be found in the following pages.

All the indigenous plants included in this Census that I did not know at sight I have worked out by the diagnosis given in Bentham's "Flora Australiensis," and I have followed the same classification and nomenclature as have been adopted in that classical reference work.

The plants marked with an asterisk are exotic, but some of them have become acclimatised in the Darling country.

The plants marked with a dagger have been figured and described, as to their economic value, by me.

Some of the most intrepid explorers in Australia have collected plants in the Darling country. Amongst them may be mentioned Sturt, Mitchell, Cunningham, McDowall Stuart, Mueller, Dallachy and Beckler, whose names will never be forgotten whilst the vegetation of Australia lasts.

Mrs. H. Forde and Mr. G. Suttor collected some interesting specimens of plants on the Lower Darling in 1865-6. These were named by the late Rev. Dr. W. Woolls, F.L.S., who wrote a chapter about them in his book entitled "A Contribution to the Flora of Australia."

Mrs. Forde's beautiful paintings of some of the plants of the Darling have already been referred to in this paper.

My thanks are due to a number of pastoralists and stockmen for forwarding me botanical specimens for identification during the last twenty years.

The accompanying table shows the percentage of the indigenous *Phanerogamia* and the vascular *Cryptogamia* of the Darling country compared with the similar flora of New South Wales.

BY FRED. TURNER.

NEW SOUTH WALES. Dicotyledonece.	Darling River. Dicotyledonece.	PER CENTAGE.
Genera 662 Species 2393	Genera 249 Species 615	Genera 37.61 Species 25.69
Monocotyledonece.	Monocotyledoneæ.	
Genera 212	Genera 61	Genera 28.77
Species 668	Species 140	Species 20.95
Acotyledonea.	Acotyledonece.	
Genera 40	Genera 4	Genera 10.00
Species 145	Species 5	Species 3·44
Total Genera 914	Total Genera 314	Genera 34·35
Total Species 3206	Total Species 760	Species 23.70

Class I. DICOTYLEDONS, Ray.

Subclass I. POLYPETALÆ.

Series I. THALAMIFLORÆ.

RANUNCULACEÆ, B. de Juss. Clematis microphylla, DC. Ranunculus lappaceus, Sm. rivularis, Banks et Sol.

DILLENIACEÆ, Salis.

Hibbertia stricta, R.Br.

PAPAVERACEÆ, Juss. Papaver horridum, DC. Argemone mexicana, Linn.†*

CRUCIFERÆ, B. de Juss.

Nasturtium palustre, DC. Cardamine tenuifolia, Hook. hirsuta, Linn. Alyssum linifolium, Steph. Sisymbrium officinale, Scop.* Blennodia filifolia, Benth.† trisecta, Benth.† 26



CRUCIFER.E. Blennodia nasturtioides, Benth. † eremigera, Benth. cardaminoides, F.v.M. lasiocarpa, F.v.M.† canescens, R.Br. cunninghamii, Benth. Stenopetalum velutinum, F.v.M. lineare, R.Br. Menkea australis, Lehm. Capsella bursa-pastoris, Mench. †* Senebiera didyma, Pers.* Lepidium leptopetalum, F.v.M. phlebopetalum, F.v. M. monoplocoides, F.v.M. papillosum, F.v.M. Thlaspi cochlearinum, F.v.M.† ochranthum, F.v.M. CAPPARIDEE, JUSS. Capparis lasiantha, R.Br. mitchelli, Lindl. loranthifolia, Lindl. Apophyllum anomalum, F.v.M. VIOLARIEE, De Cand. Viola betonicæfolia, Sm. PITTOSPOREÆ, R.Br. Pittosporum phillyræoides, DC.† Billardiera scandens, Sm. POLYGALEÆ, JUSS. Comesperma scoparium, Steetz. ericinum, DC. FRANKENIACEÆ, St. Hil. Frankenia pauciflora, DC. CARYOPHYLLEE, Labill. Stellaria glauca, With.

CARYOPHYLLEÆ. Stellaria media, Linn.* Spergularia rubra, Pers. Polycarpiea synandra, F.v.M. PORTULACEE, JUSS. Portulaca oleracea, Linn.† filifolia, F.v.M. Calandrinia polyandra, Benth. pusilla, Lindl. volubilis, Benth. ELATINEE, Cam. Bergia ammannioides, Roth. HYPERICINEE, St. Hil. Hypericum gramineum, Forst. MALVACEÆ, JUSS. Lavatera plebeia, Sims.[†] Malva rotundifolia, Linn.* parviflora, Linn.* Malvastrum spicatum, A. Gray.⁺ Sida corrugata, Lindl. spenceriana, F.v.M. argentea, Bail. intricata, F.v.M. virgata, Hook. petrophila, F.v.M. subspicata, F.v.M. Abutilon leucopetalum, F.v.M. mitchelli, Benth. cryptopetalum, F.v.M. otocarpum, F.v.M. avicennæ, Gærtn. oxycarpum, F.v.M. frazeri, Hook. Hibiscus trionum, Linn. brachysiphonius, F.v.M.

MALVACEÆ.

Hibiscus kirchauffianus, F.v.M. sturtii, Hook. Gossypium sturtii, F.v.M.† STERCULIACEÆ, Vent. Sterculia diversifolia, G. Don.† Rulingia rugosa, Steetz. Lasiopetalum behrii, F.v.M. baueri, Steetz.

Series II. DISCIFLOR Æ.

LINEÆ, De Cand. Linum marginale, A. Cunn. ZYGOPHYLLEÆ, R.Br. Tribulus terrestris. Linn. † cistoides. Linn. Nitraria schoberi, Linn. Zygophyllum apiculatum, F.v.M.† glaucescens, F.v.M. † iodocarpum, F.v.M.† billardieri, DC. fruticulosum, DC. GERANIACEÆ, JUSS. Geranium dissectum, Linn. † Erodium cygnorum, Nees.† cicutarium, L' Hér.* Oxalis corniculata, Linn. RUTACEÆ, JUSS. Zieria obcordata, A. Cunn. furfuracea, R.Br. Eriostemon linearis, A. Cunn. difformis, A. Cunn. Phebalium obcordatum, A. Cunn. glandulosum, Hook. Asterolasia mollis, Benth. Geijera parviflora, Lindl.† Atalantia glauca, Hook.

BY FRED. TURNER.

MELIACEÆ, JUSS. Owenia acidula, F.v.M. Flindersia maculosa, F.v.M.[†] OLACINEÆ, Mirb. Olax stricta, R.Br. CELASTRINEÆ, R.Br. Celastrus cunninghamii, F.v.M. STACKHOUSIEE, R.Br. Stackhousia monogyna, Labill. muricata, Lindl. RHAMNEÆ, JUSS. Ventilago viminalis, Hook. Pomaderris racemosa, Hook. Spyridium subochreatum, Reissek. eriocephalum, Fenzl. Cruptandra amara. Sm. tomentosa, Lindl. propingua, A. Cunn. buxifolia, Fenzl. SAPINDACEÆ, JUSS. Atalaya hemiglauca, F.v.M.† Heterodendron oleafolium, Desf.⁺ Dodonæa attenuata, A. Cunn.† cuneata, Rudge. peduncularis, Lindl. lobulata, F.v.M.† boroniæfolia, G. Don. stenozyga, F.v.M. Series III. CALYCIFLOR E.

LEGUMINOSÆ, JUSS.

Suborder I. PAPILIONACEÆ.

Isotropis wheeleri, F.v.M. Daviesia acicularis, Sm. PAPILIONACE.E. Pultenaa microphylla, Sieb. styphelioides, A. Cunn. foliolosa, A. Cunn. Bossia ensata, Sieb. walkeri, F.v.M. Templetonia egena, Benth. sulcata, Benth. Hovea longifolia, R. Br. Crotalaria mitchelli, Benth. cunninghamii, R.Br. dissitiflora, Benth. Medicago sativa, Linn.* denticulata, Willd.* Trifolium procumbens, Linn.* Trigonella suavissima, Lindl.[†] Lotus corniculatus, Linn. australis, Andr. Psoralea eriantha, Benth. patens, Lindl. cinerea, Lindl. tenax, Lindl. Indigofera enneaphylla, Linn. trita, Linn. f. australis, Willd. brevidens, Benth. Tephrosia rosea, F.v.M. Sesbania aculeata, Pers. Clianthus dampieri, A. Cunn.[†] Swainsona greyana, Lindl. galegifolia, R.Br.[†] phacoides, Benth. † burkittii, F.v.M. oligophylla, F.v.M. campylantha, F.v.M. procumbens, F.v. M. †

PAPILIONACE.E.

Swainsona phacifolia, F.v.M. oroboides, F.v.M.† lessertiifolia, DC. microphylla, A. Gray. frazeri, Benth. laxa, R.Br. Glycyrrhiza psoraleoides, Benth. Desmodium brachypodum, A. Gray. varians, Endl. Vicia sativa, Linn.* Glycine falcata, Benth. tubacina, Benth. sericea. Benth. tomentosa, Benth. Erythrina vespertilio, Benth. Galactia tenuifolia, Willd. Vigna lanceolata, Benth. Rhynchosia minima, DC.

Suborder II. CÆSALPINIEÆ.

Cassia sophera, Linn., var. schinifolia. pleurocarpa, F.v.M. pruinosa, F.v.M.[†] circinata, Benth.[†] phyllodinea, R.Br.[†] eremophila, A. Cunn.[†] artemisioides, Gaud.[†] sturtii, R.Br.[†] desolata, F.v.M. Petalostyles labicheoides, R.Br. Bauhinia carronii, F.v.M.

Suborder III. MIMOSEÆ.

Neptunia gracilis, Benth. Acacia continua, Benth. triptera, Benth. MIMOSEÆ.

Acacia spinescens, Benth. lanigera, A. Cunn. colletioides, A. Cunn. tetragonophylla, F.v.M. rigens, A. Cunn. juncifolia, Benth. calamifolia, Sweet. conferta, A. Cunn. aspera, Lindl. obliqua, A. Cunn. undulifolia, A. Cunn microcarpa, F.v.M. verniciflua, A. Cunn. sentis, F.v.M.† neriifolia, A. Cunn. notabilis, F.v. M. hakeoides, A. Cunn. salicina, Lindl. decora, Reichb. brachybotrya, Benth. amblygona, A. Cunn. homalophylla, A. Cunn.[†] pendula, A. Cunn.[†] oswaldi, F.v.M. stenophylla, A. Cunn. sclerophylla, Lindl. ixiophylla, Benth. harpophylla, F.v.M. excelsa, Benth. burkittii, F.v.M. aneura, F.v.M.† doratoxylon, A. Cunn. polybotrya, Benth. dealbata, Link. cardiophylla, A. Cunn.

MIMOSEÆ. Acacia farnesiana, Willd. ROSACEÆ, JUSS. Accena ovina, A. Cunn. † CRASSULACEÆ, De Cand. Tillæa verticillaris, DC. HALORAGEÆ, R.Br. Haloragis ceratophylla, Endl. odontocarpa, F.v.M. glauca, Lindl. tetragyna, Hook. Myriophyllum variæfolium, Hook. verrucosum, Lindl. Ceratophyllum demersum, Linn. MYRTACEÆ, JUSS. Calythrix tetragona, Labill. Micromyrtus microphylla, Benth. Bæckea crassifolia, Lindl. behrii, F.v.M. Leptospermum lævigatum, F.v.M. flavescens, Sm. Callistemon brachyandrus, Lindl. Melalenca uncinata, R.Br. hakeoides, F.v.M. pnstulata, Hook. Angophora intermedia, DC. Eucalyptus leucoxylon, F.v.M. melliodora, A. Cunn. gracilis, F.v.M. paniculata, Sm. populifolia, Hook. ochrophloia, F.v.M. behriana, F.v.M. pendula, A. Cunn. uncinata, Turcz.

MYRTACE.E. Eucalyptus albens, Mig. melanophloia, F.v.M. microtheca, F.v.M. dumosa, A. Cunn. incrassata, Labill. dealbata, A. Cunn. viminalis, Labill. rostrata, Schlecht. oleosa, F.v.M. terminalis, F.v.M. Syncarpia leptopetala, F.v.M. LYTHRARIEÆ, JUSS. Ammannia multiflora, Roxb. Lythrum salicaria, Linn. hyssopifolium, Linn. ONAGRARIEÆ, JUSS. Enothera biennis, Linn.* Epilobium junceum, Forst. Jussicea repens. Linn. CUCURBITACEÆ, JUSS. Cucumis trigonus, Roxb. myriocarpus, Naud.* Melothria muelleri, Benth. FICOIDEÆ, Dill. Mesembryanthemum pomeridianum, Linn.* Tetragonia expansa, Murr.[†] Aizoon quadrifidum, F.v.M. Trianthema decandra, Linn. crystallina, Vahl. Mollugo glinus, A. Rich. orygioides, F.v.M. cerviana, Ser. UMBELLIFERÆ, JUSS. Hydrocotyle trachycarpa, F.v.M.

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UMBELLIFERÆ.

Trachymene pilosa, Sm. cyanopetala, Benth. australis, Benth. glaucifolia, Benth. incisa, Rudge. Eryngium rostratum, Cav. Daucus brachiatus, Sieb.†

Subclass II. MONOPETALÆ.

LORANTHACEÆ, Juss. Loranthus linearifolius, Hook. exocarpi, Behr. linophyllus, Fenzl. pendulus, Sieb. quandang, Lindl.

RUBIACEÆ, JUSS.

Hedyotis tillæacea, F.v.M. Canthium latifolium, F.v.M. oleifolium, Hook. Pomax umbellata, Soland. Asperula scoparia, Hook. f. conferta, Hook. f. Galium geminifolium, F.v.M. gaudichaudi, DC.

COMPOSITÆ, Vaill.

Leuzea australis, Gaud. Centaurea solstitialis, Linn.^{†*} Onopordon acanthium, Linn.^{*} Olearia cydonicefolia, Benth. lepidophylla, Benth. subspicata, Benth. ramosissima, Benth. pimeleoides, Benth. conocephala, F.v.M. magnifolia, F.v.M. COMPOSITE. Olearia muelleri, Benth. decurrens, Benth. teretifolia, F.v.M. tenuifolia, Benth. Vittadinia australis, A. Rich. Podocoma cuneifolia, R.Br. Minuria leptophylla, DC. cunninghamii, Benth. integerrima, Benth. denticulata, Benth. Calotis cuneifolia, R.Br. cymbacantha, F.v.M. erinacea, Steetz. scabiosifolia, Sond. scapigera, Hook. lappulacea, Benth. microcephala, Benth. plumulifera, F.v.M. hispidula, F.v.M. Brachycome melanocarpa, Sond. pachyptera, Turcz. basaltica, F.v.M. trachycarpa, F.v.M. exilis, Sond. scapiformis, DC. ciliaris, Less. Monenteles sphacelatus, Labill. Pluchea eyrea, F.v.M. Epaltes cunninghami, Benth. australis, Less. Xanthium spinosum, Linn.* Siegesbeckia orientalis, Linn. Eclipta platyglossa, F.v.M. Glossogyne tenuifolia, Cass. Flaveria australasica, Hook.

Compositæ. Cotula australis, Hook. Myriogyne minuta, Less. racemosa, Hook. Elachanthus pusillus, F.v.M. Isoetopsis graminifolia, Turcz. Myriocephalus rhizocephalus, Benth. stuartii, Benth. Angianthus brachypappus, F.v.M. pusillus, Benth. strictus, Benth. Gnephosis criocarpa, Benth. skirrophora, Benth. cyathopappa, Benth. Calocephalus citreus, Less. platycephalus, Benth. Gnaphalodes uliginosum, A. Gray. Craspedia pleiocephala, F.v.M. chrysantha, Benth. Chthonocephalus pseudoevax, Steetz. Cassinia lævis, R.Br. arcuata, R.Br. Eriochlamys behri, Sond. et Muell. Rutidosis helichrysoides, DC. Millotia tenuifolia, Cass. greevesii, F.v.M. Ixiolana leptolepis, Benth. tomentosa, Sond. et Muell. Podolepis rutidochlamys, F.v.M. acuminata, R.Br. canescens, A. Cunn. lessoni, Benth. siemssenia, F.v.M. Leptorhynchus pulchellus, F.v.M. waitzia, Sond. Helichrysum semifertile, F.v.M.

COMPOSIT.E Helichrysum bracteatum, Willd. glutinosum, Hook. podolepideum, F.v.M. apiculatum, DC. semipapposum, DC. dockeri, F.v.M. diosmifolium, Less. adnatum, Benth. cunninghamii, Benth. Waitzia corymbosa, Wendl. Helipterum polygalifolium, DC. floribundum, DC. incanum, DC. cotula, DC. hyalospermum, F.v.M. strictum, Benth. corymbiflorum, Schlecht. pygmæum, Benth. moschatum, Benth. dimorpholepis, Benth. Gnaphalium japonicum, Thunb. indicum, Linn. Senecio gregori, F.v.M. macranthus, A. Rich. lautus, Forst. behrianus, Sond. et Muell. brachyglossus, F.v. M. cunninghami, DC. Cryptostemma calendulaceum, R.Br. †* Picris hieracioides, Linn. STYLIDIEÆ, R.Br. Stylidium eglandulosum, F.v.M. Goodenovie.e, R.Br. Velleia paradoxa, R.Br. Goodenia geniculata, R.Br.

Goodenovieæ.

Goodenia hederacea, Sm. calcarata, F.v.M. cycloptera, R.Br. pinnatifida, Schlecht. heteromera, F.v.M. glauca, F.v.M. gracilis, R.Br. Scavola spinescens, R.Br. ovalifolia, R.Br. Dampiera lanceolata, A. Cunn. CAMPANULACEÆ, JUSS. Pratia erecta, Gaud. Isotoma axillaris, Lindl. petreea, F.v.M. Wahlenbergia gracilis, DC. EPACRIDEÆ, R.Br. Melichrus urceolatus, R.Br. JASMINEÆ, JUSS. Jasminum lineare, R.Br.† APOCYNEÆ, JUSS. Alstonia constricta, R.Br. Parsonsia lanceolata, R.Br. Lyonsia eucalyptifolia, F.v.M. ASCLEPIADEÆ, R.Br. Sarcostemma australe, R.Br.+ Pentratropis guinguepartita, Benth. Marsdenia leichhardtiana, F.v.M.† LOGANIACEÆ, R.Br. Logania linifolia, Schlecht.

nuda, F.v.M.

Gentianeæ, Juss. Sebæa ovata, R.Br. Erythræa australis, R.Br.†

BORAGINEÆ, JUSS. Heliotrophum curassavicum, Linn. europaum, Linn. ovalifolium, Forst. Halgania strigosa, Schlecht. larandulacea, Endl. Trichodesma zeylanicum, R.Br. Echinospermum concarum, F.v. M. Rochelia maccoya, F.v.M. Cynoglossum suaveolens, R.Br. CONVOLVULACE.E., JUSS. Ipomæa sepiaria, Kaen. Convolvulus erubescens. Sims. Polymeria longifolia, Lindl. Breweria media. R.Br. Cressa cretica, Linn. Evolvulus alsinoides, Linn. Wilsonia humilis. R.Br. rotundifolia, Hook. backhousii, Hook. f. SOLANEÆ, JUSS. Solanum nigrum, Linn. † simile, F.v.M. parvifolium, R.Br. ferocissimum, Lindl. esuriale, Lindl. chenopodinum, F.v. M. sturtianum, F.v.M. petrophilum, F.v.M. ellipticum, R.Br. Lycium australe, F.v.M. Nicotiana suaveolens, Lehm. glauca, Grah. †* SCROPHULARINE.E, Mirb. Duboisia hopwoodii, F.v.M.

SCROPHULARINEÆ. Mimulus gracilis, R.Br. repens, R.Br. prostratus, Benth. Morgania floribunda, Benth. glabra, R.Br. Peplidium humifusum, Delile. Veronica peregrina, Linn. BIGNONIACEE, R.Br. Tecoma australis, R.Br. ACANTHACEE, R.Br. Ruellia australis, R.Br. Justicia procumbens, Linn. PEDALINEÆ, R.Br. Josephinia eugenia, F.v.M. MYOPORINEÆ, R.Br. Myoporum acuminatum, R.Br. deserti, A. Cunn.+ platycarpum, R.Br. Pholidia dalyana, F.v.M. scoparia, R.Br. divaricata, F.v.M. Eremophila bowmanni, F.v.M. oppositifolia, R.Br.† sturtii, R.Br. mitchelli, Benth. latrobei, F.v.M. macdonellii, F.v.M. longifolia, F.v.M.[†] polyclada, F.v.M. bignoniceflora, F.v.M.[†] freelingii, F.v.M. goodwinii, F.v.M. brownii, F.v.M. duttoni, F.v.M. 27

Myoporine.E. Eremophila maculata, F.v.M.† latifolia, F.v.M. alternifolia, R.Br.

VERBENACEÆ, Juss. Verbena officinalis, Linn. Spartothamnus junceus, A. Cunn.

LABIATÆ, JUSS. Mentha australis, R.Br. Prostanthera nivca, A. Cunn. striatiflora, F.v.M. microphylla, A. Cunn. aspalathoides, A. Cunn. Westringia eremicola, A. Cunn. Teucrium racemosum, R.Br. Ajuga australis, R.Br. Stachys arvensis, Linn.†* PLANTAGINEÆ, JUSS.

Plantago varia, R.Br.†

Subclass III. MONOCHLAMYDEÆ.

РнутоLACCACE.E, Endl. Gyrostemon cyclotheca, Benth. Codonocarpus cotinifolius, F.v.M.† СнехороDIACE.E, Meisn. Rhagodia parabolica, R.Br.† gaudichaudiana, Moq. spinescens, R.Br. hastata, R.Br.† nutans, R.Br.† linifolia, R.Br. Chenopodium nitrariacea, F.v.M.† auricomum, Lindl.† carinatum, R.Br.† cristatum, F.v.M.

CHENOPODIACE.E. Chenopodium atriplicinum, F.v.M.[†] Atriplex stipitata, Benth.; quinnii, F.v.M. nummularia, Lindl.; rhagodioides, F.v. M.; vesicaria, Hew.[†] velutinella, F.v. M.† angulata, Benth.; semibaccata, R.Br.† microcarpa, Benth. campanulata, Benth.† leptocarpa, F.v.M.; limbata, Benth.† halimoides, Lindl. holocarpa, F.v.M.† spongiosa, F.v.M. Enchylæna microphylla, Mog. tomentosa, R.Br.† Kochia lobiflora, F.v.M. lanosa, Lindl. triptera, Benth. brevifolia, R.Br.† pyramidata, Benth.; eriantha, F.v. M.† villosa, Lindl.† planifolia, F.v.M.; sedifolia, F.v.M.† aphylla, R.Br.† ciliata, F.v.M.⁺ brachyptera, F.v. M.† stelligera, F.v.M.[†] Chenolea dallachyana, Benth.† tricornis, Benth. sclerolænoides, F.v. M. † Babbagia dipterocarpa, F.v.M.

CHENOPODIACE.E. Sclerolana diacantha, Benth.† lanicuspis, F.v.M. bicornis, Lindl. biflora, R.Br. paradoxa, R. Br.† Threlkeldia brevicuspis, F.v.M. Anisacantha muricata, Moq. divaricata, R.Br. bicuspis, F.v.M. echinopsila, F.v.M. Salicornia robusta, F.v.M. leiostachya, Benth. tenuis, Benth. Salsola kali, Linn. AMARANTACEE, JUSS. Amarantus mitchellii, Benth. macrocarpus, Benth. tenuis, Benth. enervis, F.v.M. Trichinium oboratum, Gaud. † parviflorum, Lindl. alopecuroideum, Lindl. nobile, Lindl.† macrocephalum, R.Br. exaltatum, Benth. semilanatum, Lindl. erubescens, Moq. † Alternanthera nodiflora, R.Br. POLYGONACEÆ, JUSS. Rumex halophilus, F.v. M. Polygonum plebeium, R.Br. lapathifolium, Linn. attenuatum, R.Br. Muhlenbeckia polygonoides, F.v.M. cunninghamii, F.v.M.

NYCTAGINEÆ, JUSS. Boerhaavia diffusa, Linn.† PROTEACE, JUSS. Isopogon petiolaris, A. Cunn Grevillea pterosperma, F.v. M. huegellii, Meisn. striata, R.Br. triternata, R.Br. Hakea purpurea, Hook. leucoptera, R.Br.[†] THYMELEE, JUSS. Pimelea colorans, A. Cunn. spathulata, Labill. collina, R.Br. sericostachya, F.v.M. microcephala, R.Br. flava, R.Br. curviflora, R.Br., var. EUPHORBIACEÆ, JUSS. Euphorbia australis, Boiss. drummondii, Boiss. eremophila, A. Cunn. Beyeria viscosa, Miq. Ricinocarpus bowmanni, F.v.M. Bertya cunninghami, Planch. mitchelli, Muell. Phyllanthus rigens, Muell. ramosissimus, Muell. lacunarius, F.v.M. Adriana acerifolia, Hook. Ricinus communis, Willd. +* CASUARINE.E., Mirb. Casuarina stricta, Ait. glauca, Sieb.† cunninghamiana, Miq. distyla, Vent.

SANTALACEÆ, R.Br.

Santalum lanceolatum, R.Br., var. angustifolium. Fusanus acuminatus, R.Br.† Exocarpus spartea, R.Br. aphylla, R.Br. stricta, R.Br.

Subclass IV. GYMNOSPERMÆ.

Coniferæ, Juss. Frenela robusta, A. Cunn. endlicheri, Parlat.

Class II. MONOCOTYLEDONS, Ray.

HYDROCHARIDEÆ, Lam. Ottelia ovalifolia, L. C. Rich. Hydrilla verticillata, Casp.

ORCHIDEÆ, R.Br. Cymbidium canaliculatum, R.Br.

AMARYLLIDEÆ, St. Hil. Crinum flaccidum, Herb. Calostemma purpureum, R.Br. luteum, Sims.

LILIACEÆ, De Cand. Bulbine bulbosa, Haw. semibarbata, Haw. Thysanotus baueri, R.Br. Corynotheca lateriflora, F.v.M. Tricoryne elatior, R.Br.

COMMELYNACEÆ, Endl. Commelyna ensifolia, R.Br.

JUNCACEÆ, Agardh. Xerotes longifolia, R.Br. filiformis, R.Br. leucocephala, R.Br. Luzula campestris, DC. Juncus communis, E. Mey. NAIADEÆ, Agardh. Potamogeton natans, Linn. crispus, Linn. CYPERACEÆ, R.Br. Cyperus pygmæus, Rottb. gracilis, R.Br., var. squarrosus. Linn. difformis, Linn. concinnus, R.Br. vaginatus, R.Br. gilesii, Benth. fulvus, R.Br. iria. Linn. diphyllus, Retz. rotundus, Linn.† subulatus, R.Br. exaltatus, Retz. Heleocharis acuta, R.Br. Fimbristylis velata, R.Br. neilsoni, F.v.M. barbata, Benth. Scirpus setaceus, Linn. Scheenus turbinatus, Benth. aphyllus, Beeck. melanostachyus, R.Br. Carex gunniana, Boott. GRAMINEÆ, R.Br. Eriochloa punctata, Hamilt.⁺ Panicum cænicolum, F.v.M.† divaricatissimum, R.Br., et vars. macractinium, Benth.[†] leucophæum, H. B. et K., et vars.† flavidum, Retz., et var. † gracile, R.Br.† helopus, Trin. gilesii, Benth.

GRAMINE.E. Panicum distachyum, Linn.† reversum, F.v.M. colonum, Linn. crus-galli, Linn.† adspersum, Trin. miliaceum, Linn.* effusum, R.Br., et var. mitchelli, Benth. decompositum, R.Br.; trachyrhachis, Benth. prolutum, F.v.M. Setaria glauca, Beauv. viridis, Beauv.* Plagiosetum refractum, Benth. Chamaraphis spinescens, Poir. Spinifex paradoxus, Benth. Lappago racemosa, Willd. Neurachne alopecuroides, R.Br. mitchelliana, Nees.[†] munroi, F.v.M. Perotis rara, R.Br. Pollinia fulva, Benth.; Andropogon erianthoides, F.v.M.† sericeus, R.Br.† exaltatus, R.Br. bombycinus, R.Br.† Chrysopogon gryllus, Trin. Sorghum halepense, Pers. Anthistiria ciliata, Linn.† avenacea, F.v.M.† membranacea, Lindl. Alopecurus geniculatus, Linn. Phalaris canariensis, Linn.* Aristida stipoides, R.Br. arenaria, Gaud.

GRAMINEÆ. Aristida behriana, F.v.M. leptopoda, Benth. ramosa, R.Br. calycina, R.Br. Stipa elegantissima, Labill. tuckeri, F.v.M. setacea, R.Br. aristiqumis, F.v.M. scabra, Lindl. Deveuxia forsteri, Kunth. Avena fatua, Linn.* Amphibromus neesii, Steud. Danthonia bipartita, F.v.M.⁺ pallida, R.Br.† semiannularis, R.Br.+ Amphipogon strictus, R.Br.; Pappophorum nigricans, R.Br.+ avenaceum, Lindl. † Astrebla pectinata, F.v.M.; triticoides, F.v.M., et var. elymoides, F.v.M.; Triraphis mollis, R.Br., et var. Triodia mitchelli, Benth. pungens, R.Br. irritans, R.Br. Cynodon dactylon, Pers. † Chloris acicularis, Lindl. truncata, R.Br., et var. † ventricosa, R.Br., et var. Eleusine ægyptiaca, Pers.† Leptochloa subdigitata, Trin. Diplachne loliiformis, F.v.M. fusca, Beauv.† Sporobolus virginicus, Kunth., var. pallida. † indicus, R.Br.† pulchellus, R.Br.

GRAMINEÆ. Sporobolus lindleyi, Benth. † actinocladus, F.v.M. Eriachne aristidea, F.v.M. obtusa, R.Br.† Ectrosia leporina, R.Br., et var. Lamarckia aurea, Moench.* Phragmites communis, Trin. Elythrophorus articulatus, Beauv. Eragrostis tenella, Beauv. megalosperma, F.v.M. pilosa, Beauv.† kennedyce, Tur. brownii, Nees. laniflora, Benth. eriopoda, Benth. chætophylla, Steud. lacunaria, F.v.M.† falcata, Gaud. Poa annua, Linn.* lepida, F.v.M. Glyceria fordeana, F.v.M.† ramigera, F.v.M.⁺ Bromus arenarius, Labill., et var. Ceratochloa unioloides, DC.* Ayropyrum scabrum, Beauv.; Lepturus cylindricus, Trin. Hordeum murinum, Linn.* Class III. ACOTYLEDONS, Juss. LYCOPODIACE.E., Swartz. Azolla pinnata, R.Br. rubra, R.Br. MARSILEACEÆ, R.Br. Marsilea drummondii, A.Br.† FILICES, Linn. Cheilanthus tenuifolia, Swartz. Notholiena vellea, R.Br.